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ABSTRACT

Teaching strategies used by precepters at a hospital-based family medicine center were investigated with seven preceptors who had previous teaching experiences and were board certified (six in family medicine). A third-year senior resident presented and discussed two patient cases to the preceptors in separate one-to-one teaching sessions, and the preceptors were told to treat the case as they would for a first-year resident. The senior resident constructed fictitious history, physical, examination, and treatment information for an acute patient problem (unambiguous case) and a chronic patient problem (ambiguous case). Certain points of information judged critical to diagnosis and treatment were withheld but would be given to the preceptor upon request. Preceptor views of the objectives for the teaching conference were also elicited. Preceptors were found to differ on the questioning strategies used; on each case the individual preceptors varied on the number of lower and higher order questions asked. The preceptors required more time and asked more questions for the acute problem case. However, the preceptors who asked many or few questions kept the same relative pattern for both cases. There appeared to be a correlation between use of treatment questions and preceptor effectiveness. Preceptor effectiveness was also measured by rank ordering by a faculty member based on pre-identified criteria. Based on these rankings, it is suggested that organization and specificity of preceptor goals may be a variable related to effectiveness. In debriefing sessions, preceptors requested more information on their teaching performance and expressed interest in learning about alternative teaching styles. (SW)

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A Model for Analyzing Precepting in the Clinical Setting

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- INTRODUCTION -

The field of clinical teaching is receiving emphasis in the medical and professional education literature as the helping professions increasingly recognize the need for systematic training of precious teaching resources. Daggett (1979) reviewed the study of clinical teaching and found a need for more research conducted in clinical settings, focused on what physicians actually do, the type of interactions that occur and the determinations of what is important to be taught.

Initial studies of the one-to-one teaching and supervising (precepting) have borrowed from the research in classroom teaching and have attempted to identify critical variables that affect instructor ratings in clinical settings (e.g., Irby, 1978). Recent literature in clinical decision-making and clinical judgment suggest that these variables should be further defined particularly in the area of questions, feedback, and task definition (Elstein, Shulman, Sprafka, 1978). An extrapolation of the clinical judgment studies to the clinical teaching domain would indicate that the variables such as cue acquisition, and hypothesis generation represent skills that a preceptor must notice. It has been postulated that the effectiveness of any problem solving strategy is affected by the particular factors of a presenting problem. Similarly, it can be hypothesized that specific clinical problems interact with and affect selection of precepting (supervising) strategies.

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OBJECTIVES

To study the phenomenon of preceptor behavior, a pilot test was conducted using one senior resident and seven preceptors at a hospital-based Family Medicine Center. The purpose of the study was to

1. Investigate differences that exist in teaching strategies among preceptors who are presented with the same case materials by the same residents separate teaching sessions.

2. Identify differences in teaching styles that exist when presentors are presented with cases that systematically vary in content, specificity and problem type.

3. Elicit preceptor veiws of the purpose of their teaching sessions.

4. Explore how the information derived from the study can be used to effect changes in clinical teaching training.

The sampling plans were developed to include one preceptor from each of the ten (10) clinic sessions held weekly at the program. Due to scheduling constraints, three (3) preceptors were excluded. The preceptors had previous teaching experiences and were Board Certified (six in Family Medicine). The group include four (4) full-time and three (3) part-time faculty members.

METHOD

A third-year senior resident presented and discussed two patient cases to seven (7) preceptors in separate one-to-one teaching sessions in the setting and in the manner identical to current clinical practice. The only exceptions were that the sessions were tape-recorded, the preceptors were informed that they were in a study, and one-half of the preceptors were asked questions about teaching strategy before the second case presentation. The preceptors were told to treat the case as they would for a first-year resident. The cases were counter-balanced to control for order effects.

INDEPENDENT VARIABLES

The senior resident constructed fictitious history, physical, examination and treatment information for an acute patient problem (unambiguous case) and a chronic patient problem (ambiguous case). The case presentation (history, physical, problem list and plans) were formulated to represent the knowledge of a first-year resident. Certain points of information judged critical to diagnosis and treatment were withheld. It was anticipated that the preceptors would ask for this information during the case presentation. The information would only be given upon direct request of the preceptor.

A set of questions and prompt,ings aimed at eliciting the preceptors objectives for the teaching conference were also developed. The case information, questions and presentation techniques were pre-tested with a senior faculty

member for accuracy and confirmation of judgments. In addition, a faculty member was asked to read transcripts of the teaching conferences, construct criteria for rating the conversations and rank order the seven conversations for each case presentation.

DEPENDENT VARIABLES

Dependent variables included numbers of exchanges between preceptor and resident, numbers and types of questions asked, numbers of responses matching anticipated responses, length of teaching sessions, and statements by preceptors on the goals of the conference. The category types of questions were sub-divided into higher and lower order questions. Next those questions were further divided into questions aimed at cue acquisition, hypothesis generation, cue interpretation and treatment.

ANALYSIS

Transcripts of the sessions were made from tape recordings. Specifications for categorizing each question type were constructed and performed by the author. Data was summarized by preceptor and by case. The quantitative data was examined by analysis of variance, Chi Square and T test procedures.

RESULTS

Preceptors were found to differ on the questioning strategies used. Chi Square tests reveal that on each case presented the individual preceptors varied among themselves on number of lower and higher order questions asked. Inspection of the data suggests a wide range of differences among preceptors on the dependent measures.

There also appears to be differences across the group of preceptors that can be attributed to the nature of the presenting case. Tables One and Two summarize the mean score of the preceptor group on each of the dependent measures. Analysis using paired tests indicates that the preceptors required more time and asked more quesions when Case One was presented $P < .05$. When question categories are analyzed, the only difference suggested is in the area of treatment questions ($P < .07$). Chi Square tests reveal no differences among individual preceptors when they are compared with themselves on Cases One and Two. The results suggest that while the type of case alters preceptor behavior in the sense that less questions are asked, it does not alter basic variations in style (eg., the preceptors asking many or few questions keep the same relative pattern across cases). The exception appears to be the interaction of Case type and treatment question.

Another way to view the results is to construct a profile of questioning strategies used by the preceptor group in each case presented. A profile was developed by totaling the proportion of questions asked in each question category. The analysis revealed that there is similarity between cases in the precentage of questions used from each category. The only significant difference is that a greater proportion of questions were asked in the treatment category for Case One.

Preceptor effectiveness was measured in two ways. The first strategy counted the number of anticipated responses that the preceptor, in fact, correctly made. The second method used was a ranking ordering by a faculty

member based on his own pre-identified criteria. While the Sample size is too small to permit definitive results, it does suggest that there is a correlation between the two measures (.68 for Case One and .43 for Case Two). Further, when each of these measures is correlated with questioning strategies, there appears to be a correlation between use of treatment questions and preceptor effectiveness.

Preceptors varied in their answers to questions regarding purpose or objectives in the teaching conferences. The answers ranged from vague responses (i.e., "Teach the resident..." or "Supply information...") to very specific replies concerning students' organization of problems.

Examination of the highest and lowest rated preceptor conferences suggests that organization and specificity of goals may be a variable related to effectiveness.

The results of this pilot study must be considered preliminary, but would suggest that while there are differences in individual preceptor's styles, case factors can account for some changes in teaching strategy. Certain questioning strategies seem to be more effective in eliciting data pre-selected as important.

IMPLICATIONS

Previous studies of clinical teaching in actual clinic settings lacked control of case details and, thus, preceptors were compared under different conditions. This study would suggest that teaching is altered by the nature of the presenting case.

Earlier studies have suggested that problem-solving strategies are important tools of diagnosis and should be taught to students. This study suggests that these factors can be used in a clinic precepting conference as a method for examining teaching styles.

Preceptors, in debriefing sessions, requested more information on their teaching performance and expressed interest in learning about alternative teaching styles. Meleca (1978) states that one of the problems identified by the clinical teaching literature is the lack of exposure to formal teaching practices and variety of methods by clinical supervisors. Examining transcripts of case presentations appears to be a viable method of self-assessment of teaching. The fact that preceptors vary in their effectiveness and that the variability may be due to case factors is consistent with the studies in clinical reasoning, Elstein (1978). This would suggest that the use of group meetings for preceptor conferences are beneficial because they permit variety of views to be expressed and weaknesses identified.

In addition, just as clinical judgment studies emphasize problem-solving heuristics and protocols for students, preceptors may benefit from teaching protocols and examination of efficient teaching guidelines. Another variable that could be manipulated and studied in clinical teaching is the order in the questioning strategy. This study suggests that the proportion of question types asked is stable. Of interest would be an examination of the effects when preceptors are required to use a prescribed order. For example, in this study, preceptors tended to move from cue questions toward hypothesis and treatment questions. If hypothesis questions were emphasized earlier, one might predict a different set of responses from the clinical teachers.

Attempts to measure teacher performance face the traditional problem of correlating ability to execute methods with the ability to select salient features in any given teaching task.

This study attempted to use preselected critical features of a case as a criterion measure. Further research is needed to specify the nature of clinical problems and the efficacy of training with alternative precepting strategies to meet the problems.

PROFILE OF TWO CLINICAL TEACHING SESSIONS N=7

VARIABLE	CASE 1 ACUTE PROBLEM	CASE 2 CHRONIC PROBLEM	BETWEEN GROUP F DIFFERENCE	2/TAIL PROBABILITY
Time for Conference	$\bar{X}$ = 8.9 minutes	8.1 minutes	4.97	.05
Number of Exchanges	$\bar{X}$ = 28 exchanges	$\bar{X}$ = 20 exchanges	2.55	.13
Number of Questions	$\bar{X}$ = 15.6 questions	$\bar{X}$ = 10.6 questions	2.48	.14
Number of Lower Order Questions	$\bar{X}$ = 9.86 questions	$\bar{X}$ = 7.29 questions	2.52	.13
Number of Higher Order Questions	$\bar{X}$ = 5.71 questions	$\bar{X}$ = 3.57 questions	.72	.41
Acquisition Questions	$\bar{X}$ = 5.28 questions	$\bar{X}$ = 4.28 questions	.67	.42
Interpretation Questions	$\bar{X}$ = 3.00 questions	$\bar{X}$ = 2.14 questions	.89	.36
Hypothesis - Generation Questions	$\bar{X}$ = 2.71 questions	$\bar{X}$ = 2.71 questions	.00	1.00
Treatment Questions	$\bar{X}$ = 3.42 questions	$\bar{X}$ = 1.00 questions	4.29	.06

PAIRED T TEST OF DIFFERENCES BETWEEN CASE I ACUTE AND CASE 2 CHRONIC ON SELECTED VARIABLES

VARIABLE	T STATISTIC	P VALUE
Teaching Time	2.24	.067
Conference	2.60	. 04
Exchanges	2.05	. 08
Questions	2.53	. 04
Lower order questions	2.09	. 08
Higher order questions	1.81	. 12
Cue Acquisition questions	1.00	. 35
Cue Interpretation questions	1.69	. 14
Hypothesis questions	0.00	1.00
Treatment questions	2.19	.07

PROFILE OF TWO CLINICAL TEACHING
CASE PRESENTATIONS

COMPARISON OF THE PROPORTION OF
QUESTIONS IN EACH CATEGORY

TYPE OF QUESTION	CASE 1	CASE 2	Differences Between 1 and 2	
			2	P Value
Cue Acquisition	33.9%	39.5%	1.729	.10
Cue Interpretation	19.3%	19.0	.16	N.S.
Hypothesis Generation	14.4%	17.1	.13	N.S.
Treatment	22.0	9.2	6.063	.001
Other	6.4	5.3	.85	N.S.
Lower order questions	63.3	67.1	--	--
Higher order questions	36.7	32.9	--	--

CORRELATION OF RATINGS TO SELECTED VARIABLES

VARIABLE	TOTAL CASES	CASE 1	CASE 2
	N=14	N=7	N=7
Teaching Time	.21	.20	.31
Conference Time	.18	.15	.34
Exchanges	.22	.19	.30
Questions	.12	.06	.24
Lower order questions	-.28	-.51	-.17
Higher order questions	.35	.30	.49
Cue acquisition questions	-.47	-.47	-.50
Cue interpretation questions	.02	.08	.04
Hypothesis questions	.24	.05	.57
Treatment questions	.37	.30	.76
Expected response	.50	.68	.43

CORRELATION OF CORRECT RESPONSES
TO SELECTED VARIABLES

VARIABLE	TOTAL CASE	CASE 1	CASE 2
Teaching Time	.26	-.20	.44
Conference Time	.18	-.23	.31
Number of Exchange	.40	.45	.22
Questions	.25	.27	.02
Lower order questions	.35	.20	.23
Higher order questions	.09	.21	-.19
Cue acquisition questions	.15	.01	.15
Cue interpretation questions	-.05	.11	-.38
Hypothesis questions	-.07	-.16	-.01
Treatment questions	.54	.51	.55
Rating	.50	.68	.43

CHI SQUARE TEST

... comparing differences between preceptors on questioning strategies.

	Value	Prob.
Lower order questions vs higher order questions - across cases	33.62	.000
Lower order questions vs higher order questions - Case 1	18.477	.005
Lower order questions vs higher order questions -	18.867	.004